Assessment of Groundwater Quality: Case Study of Tshivhasa, Limpopo Province, South Africa

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Abstract

Water is considered to be the most precious and important (resource) of all the natural resources. Groundwater plays a vital role in sustaining the livelihood of most people staying in the rural areas of South Africa owing to the fact that rural water supply is limited due to insufficient pipe-borne water supply. Salinity is regarded as one of the major contributors to water pollution, not only in rural areas but throughout South Africa. The main aim of this study was to assess the quality of groundwater in Tshivhase villages. The investigation of groundwater quality involved analysis of physical water quality parameters such as pH, electrical conductivity, turbidity, salinity, and geostatistical analysis. Water samples were collected from seven different boreholes a period of four months. EC, pH, and TDS meter were used to measure the physical parameters and turbidity was measured using a turbidity meter. The results show that the pH values for the boreholes ranged between 6.61 and 8.26 meaning that the water in all the boreholes was slightly acidic to alkaline. The EC of the boreholes ranged from 947 to 2350 µs/cm, and the concentrations of EC were found to be above the recommended standard for water quality. The turbidity of all the boreholes was found to be within the range of 1–5 NTU indicating that all the boreholes were within required standard. Lastly, the TDS of the sampled water ranged from 660 to 1790 mg/l; meanwhile, the salinity was ranged from 465 to 1120 ppm. Both the TDS and the salinity were found to be relatively higher compared to the recommended standard by DWAF.